# A Vapor Entraining Magnetic Mixer for Equilibrium, Reaction and Extraction Applications

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Mixing of fluids is a central component to innumerable operations in chemical processing on the plant floor and also in many laboratory operations. Most mixing applications simply require the efficient blending of fluids present in a single phase, such as the mixing of the individual components of a liquid. For these applications, magnetic stirrers often provide a convenient and efficient blending without creating ambient air entrainment into the liquid. This is especially true of fluid mixing operations done in the laboratory. There are many other applications, however, in which the entrainment of a vapor phase with a liquid is specifically desired. Examples of these applications include mixing in two-phase reaction vessels and in apparatus to measure vapor-liquid equilibrium. These mixing operations are difficult to accommodate with magnetic stirrers because the vast majority of such stirrers are designed not to entrain vapor. In this talk, we present a novel design of a mixing rotor that efficiently mixes the liquid phase and also achieves entrainment of vapor in the liquid. This rotor has been used in the measurement of vapor liquid equilibria, chemical reaction kinetics, and in supercritical fluid extraction. Examples from these three applications will be described.